

# A REVIEW OF THE COBITOID FISHES OF THE BASIN OF THE AMUR.

By LEO BERG,

*Of the Zoological Museum of the Imperial Academy of Sciences, Saint Petersburg.*

This paper contains a review of the Cobitidae known to inhabit the water system of the Amur River. It is based on material belonging to the Zoological Museum of the Imperial Academy of Sciences at St. Petersburg and duplicates in the United States National Museum.

## I. MISGURNUS FOSSILIS ANGUILLICAUDATUS (Cantor).

*Cobitis fossilis* GEORGI, Reise, I, 1775, p. 354 ("Nertschinskische Flüsse.")

*Cobitis anguillicaudatus* CANTOR, Ann. Mag. Nat. Hist., IX, 1842, p. 485 (Chusan).

*Cobitis decemcirrosus* BASILEWSKY, Mém. Soc. Nat. Moscou, X, 1855, p. 239 (Peking).

*Cobitis fossilis* var. *mohoity* DYBOWSKI, Verh. zool.-bot. Gesell. Wien, XIX, 1869, p. 957 (Onon, Ingoda).

*Misgurnus fossilis* WARPACHOWSKI, Vestn. Rybopr. (Russian), VII, 1892, p. 153 (Khanka Lake, No. 8414).

*Misgurnus anguillicaudatus* JORDAN and FOWLER, Proc. U. S. Nat. Mus., XXVI, 1903, p. 766 (Japan, Formosa; contains full synonymy).

*Misgurnus decemcirrosus* JORDAN and SNYDER, Proc. U. S. Nat. Mus., XXX, 1906, p. 833 (N. E. China) and *M. anguillicaudatus* (Japan, S. E. China, Chusan, Shanghai).

*Ussuria leptcephala* NIKOLSKY, Ann. Mus. Zool. Pétersb., VIII, 1903, p. 362 (Ussuri, Kerulen; Nos. 10655, 12791).

After comparing *M. anguillicaudatus* from East Asia with specimens of *M. fossilis* from Europe (see table), I became convinced that they are closely allied (as noticed already by Doctor Günther.)<sup>a</sup> The only obvious distinguishing character is the color; in European and West Siberian specimens there are on the sides of the body longitudinal bands, while in east Asiatic specimens the bands are substituted by irregularly distributed dark spots. Some specimens from Amur, as regards the color, are intermediate between *anguillicaudatus* and *fossilis*. As the plastic characters are identical in both species, I regard *anguillicaudatus* as a subspecies of *fossilis*.

<sup>a</sup>Cat. Fish., VIII, 1868, p. 345.

This subspecies varies much more than the European form, especially as regards the length of pectorals; the width and depth of body are also subject to much variation.

In a recent paper<sup>a</sup> Messrs. Jordan and Snyder have referred specimens from northeastern China to *M. decemcirrosus* Basilewsky, and indicated that they differ from *anguillicaudatus* as follows:

- a. Scales relatively large, about 112 (105 to 118) in a lateral series; body plump, the depth  $6\frac{1}{2}$  to  $6\frac{2}{3}$  in body; head  $6\frac{1}{2}$  to  $7\frac{1}{3}$  in length; barbels long, the longest  $1\frac{1}{2}$  to  $2\frac{2}{3}$  in head; eye, 2 to 3 in snout; color, relatively plain, the stripes and spots not very distinct. Streams of northeastern China.....*decemcirrosus*.
- aa. Scales relatively small, about 148 (143 to 154) in lateral series; body slender, the depth  $6\frac{2}{3}$  to 8 in length; head,  $6\frac{1}{2}$  to  $6\frac{1}{2}$  in length; barbels short, the longest  $3\frac{1}{4}$  to  $4\frac{1}{2}$  in head; eye,  $2\frac{2}{3}$  to 3 in snout; coloration rather brighter, but very variable; the body with dark lateral shades and more or less numerous small black spots. Streams of Japan, common everywhere in Hondo, Shikoku, and Kiusiu; also in southeastern China, Chusan, Shanghai, etc.

*anguillicaudatus*.

The examination of a large collection of *M. anguillicaudatus* from Amur, China, and Japan, belonging to our museum, convinced me that *decemcirrosus* is a nominal species. If we regard the specimens from near Peking as a distinct species, we shall be obliged to regard many varieties of the same species found in other parts of China and in Japan also as distinct species, which is inadmissible in consequence of the known variability of *anguillicaudatus*.

Concerning the scales, I am unable to find any differences between the Japanese and north Chinese specimens. In Nos. 2341 and 8640 from Peking, I count 145 scales, in No. 8640 from Peking (Kansu), 150, in specimens from Japan, 155-170. Also in *M. fossilis* the number of scales in the lateral line is subject to much variation. In specimens from Europe I find 165-175 scales, while Valenciennes<sup>b</sup> gives 135-140. As regards the depth of the body I find in Japanese 6.3-9.1, (in body without caudal) in north Chinese, 6.7-7.2, in specimens from Amur, 6.8-9.0; length of head is respectively 6.4-6.8, 6.1-6.2, 6.8-7.8; eye in snout, 2.2-2.6, 2.3-2.4, 2.0-4.4, etc. Both in China and Japan there are specimens that are plain as well as brightly colored. Most convincing to me was a comparison between No. 4280 from Japan (Doctor Schlegel's collection) and No. 2341 from Peking; they belong to a variety with high body and differ in no respect one from another; scales, color, as plastic characters, are quite identical. On the other hand, bright colored specimens from Nagasaki (No. 7515) are identical with similarly colored specimens from the Amur Basin (No. 12791).

<sup>a</sup>Proc. U. S. Nat. Mus., XXX, 1906, p. 833.

<sup>b</sup>Cuvier and Valenciennes, XVIII, 1846, p. 48.

Measurements.	<i>M. fossilis.</i>		<i>Misgurnus fossilis anguilli caudatus.</i>									
	Basel, No. 2447.	Dnieper, No. 10144.	Lake Khanka, No. 8414.	Do.	Sungari, No. 13703.	Ussuri, No. 10655.	Peking, No. 2341.	Pikua Kansu, No. 8040.	Nagasaki, No. 7315.	Do.	Nagasaki, No. 8439.	Japan, No. 4280.
Total length in mm .....	182	168	135	134	197	143	191	147	156	137	117	141
Length of body without caudal ( <i>l</i> ).....	155	145	117	116	170	125	165	123	136	120	100	121
Lateral line.....	170	175	165	170	.....	.....	145	150	155	.....	.....	170
Depth of body in length ( <i>l</i> ).....	7.0	7.6	9.0	8.6	6.8	.....	8.6	6.7	7.2	9.1	8.0	7.5
Length of head in ( <i>l</i> ).....	6.7	6.2	7.3	6.8	6.6	.....	7.8	6.2	6.1	6.8	6.7	6.4
Length of barbel in head.....	2.62	2.61	2.66	2.61	3.40	.....	2.66	3.12	3.47	2.96	3.00	2.58
Eye in snout.....	3.0	4.0	2.0	3.1	4.4	.....	2.4	2.4	2.3	2.3	2.2	2.6
Width of body in ( <i>l</i> ).....	9.7	10.8	11.7	11.0	8.9	13.1	9.2	8.0	13.3	11.8	10.0	9.3
Length of pectoral in ( <i>l</i> ).....	8.6	9.1	6.6	8.3	11.3	10.4	9.1	8.0	10.8	10.9	5.7	10.1
Length of caudal peduncle in ( <i>l</i> ).....	5.7	5.5	6.2	6.1	6.8	5.5	5.9	6.5	6.5	5.0	5.7	5.5

The genus *Ussuria* established by M. Nikolsky is based on an error. *Ussuria* is described as having only 8 cirri (2 on the mandible), otherwise as in *Misgurnus*; but after examining the type specimens No. 10655 and No. 12791 I find in both 10 cirri (4 on the mandible), otherwise these specimens are quite identical with *M. fossilis anguillicaudatus*.

We have many specimens from the basin of Amur: basin of Khanka or Haupa Lake (No. 8414), Ussuri at Khabarovsk (No. 10655), Kerulén River (tributary of Argun; No. 12791); Da-chu-ang, tributary of Sungari (No. 13703), from China; Peking, Pikua in Kansu, Hui-hsien in S. Kansu, from Japan.

LEFUA Herzenstein.

*Otonema* HERZENSTEIN, Trud. Soc. Natur. Petersburg, XIX, 1887, p. 47 (*pleskei*=*costata*; name preoccupied).

*Lefua* HERZENSTEIN, Przewalski's Fische, 1888, p. 91 (*pleskei*=*costata*).

*Elvis* JORDAN and FOWLER, Proc. U. S. Nat. Mus., XXVI, 1903, p. 768 (*nikkonis*).

Cirri 8, four rostral, two maxillary and two at the anterior nostrils. Scales present. No erectile spine below the eye. Dorsal fin about over the ventral, with few rays; caudal rounded. Air bladder with a posterior part free in the abdominal cavity. Two species: *L. Costata* in the basin of Amur, N. China, and Korea; *L. nikkonis* in N. Japan.

2. LEFUA COSTATA (Kessler).

*Diplophysa costata* KESSLER in Przewalski, Mongolia, and the Land of Tanguts, II, 1876, Fishes, p. 29, pl. 111, fig. 3 (Dalai-nor Lake, inner basin of E. Mongolia, No. 2477).

*Otonema pleskei* HERZENSTEIN, Trud. Soc. Nat., Petersburg, XIX, 1887, p. 48, fig. 5 (Khanka Lake, No. 7209).

*Lefua costata* HERZENSTEIN, Przewalski's Fische, 1888, p. 93 (No. 2477).

*Lefua pleskei* HERZENSTEIN, Przewalski's Fische, 1888, p. 95 (No. 7209).

*Nemachilus dixonii* FOWLER, Proc. Acad. Nat. Sci., Phila. 1899, 1900, p. 181 (Tan-lan-ho, near Dolon-noor, trib. of Liao-ho).

*Ellicis coreanus* JORDAN and STARKS, Proc. U. S. Nat. Mus., XXVIII, 1905, p. 201, fig. 7 (Gensan, Fusan).

We have specimens from Dalai-nor Lake (No. 2477), Ulugui River (in Khinghan mountains), Khanka Lake (Ussuri River), Da-chu-ang (tributary of Sungari), Vladivostok (in a rivulet), numerous specimens in Gensan (Korea, No. 13723).

### 3. NEMACHEILUS BARBATULUS TONI (Dybowski.)

*Cobitis toni* DYBOWSKI, Verh. zool.-bot. Gesell. Wien, XIX, 1869, p. 957, pl. XVIII, fig. 10 (system of Amur; Onon, Ingoda); Verh. zool.-bot. Gesell.

Wien, XXIV, 1874, p. 392 (system of Baikal; Angara, Selenga, Kossogol L.).  
? *Nemachilus compressirostris* WARPACIOWSKI, Ann. Mus. Zool. Petersb., II, 1897, p. 270 (a lake in N. W. Mongolia, basin of Ob).

*Nemachilus pechiliensis* FOWLER, Proc. Acad. Nat. Sci. Phila., (1899) 1900, p. 181 (Liao-ho).

*Nemachilus toni* BERG, Ann. Mus. Zool. Petersb., V, 1900, p. 362, pl. VIII, fig. 10 (Baikal; basin of Selenga).

*Orthrias oreas* JORDAN and FOWLER, Proc. U. S. Nat. Mus., XXVI, 1903, p. 769, fig. 2 (Japan; Chitose in Iburi, Hokkaido).

*Nemacheilus barbatulus toni* BERG, Trav. Section Troitzkoz-Kiakhta Soc. Russ. Geogr., VIII, No. 3, (1905) 1906 p. 66 (Kossogol Lake, Baikal Lake, basin of Amur, Sakhalin).

The loach from East Asia differs very slightly from the common *N. barbatulus* from Europe and W. Siberia, as is proved in my above-mentioned Russian paper, where measurements may be found. The genus *Orthrias* Jordan and Fowler differs from *Nemacheilus* van Hasselt only in having the caudal fin truncate instead of forked. This character is scarcely of generic value, as in some central Asiatic *Nemacheilus* the caudal fin in young specimens is emarginated, while in adult ones it becomes truncate. We have specimens from the Khanka Lake (No. 8485), Argun River (No. 3205), and mouth of Amur (No. 13828), also numerous specimens from the Baikal Lake, Kossogol Lake, Ob River.

### 4. COBITIS TÆNIA Linnæus.

There are no differences between the specimens from the Amur River and *C. tænia* from Europe and Japan. *C. sinensis* Sauvage, judging from one specimen from Pung-tung (Korea), seems to be a distinct subspecies, *C. tænia sinensis*, differing from typical *tænia* by its lateral blotches, being very high, narrow, and extending far below the lateral line.

*C. tænia* is widely distributed through the Amur basin. We have specimens from Argun River, Albasin, Khinghan, Khanka Lake, Ussuri River, mouth of Amur.